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#### **REMARKS**

- 1. Reconsideration in view of the remarks and amendments herein is respectfully requested.
- 2. Claims 1-17, and 19-30 are remaining with the Application.

Claims 23-30 stand allowed. Claims 2 and 3 stand objected to as based on a rejected base claim, but would be allowable if rewritten in independent form including all of limitations of the base claim and any intervening claims. Claims 1, 4-17, and 19-22 stand rejected.

3. (Referring now to Item 1 of the Official Action) The disclosure stands objected to for the reason that various fatty acids such as oleic, linoleic, linolenic, and palmitic acids are not of vegetable origin. Additionally, the disclosure stands objected to because various acyl groups such as palmitoyl, arachidoyl, behenoyl, myristoyl, and margaroyl are not of vegetable origin. The examples in the application stand objected to for the same reasons.

Applicant hereby submits copies of several pages from the "Fats and Oils Handbook" by Michael Bockish (English Edition), AOCS Press (1998) (*Reference 1*). Page 64 of and 65 of the text provides vegetable oil sources for many of the above acids or acyl groups. Each of the above mentioned acids or acyl groups can be obtained from vegetable oils such as the following with the relevant page number in parenthesis:

Oleic acid—soybean (229), peanut (251), rapeseed (259), and palm kernel (277); Linoleic- soybean (229), peanut (251), rapeseed (259), and palm kernel (277); Linolenic- linseed (65), soybean (229), peanut (251), and rapeseed (259); Palmitoleic- soybean (229), peanut (251), and rapeseed (259); Palmitoyl (from palmitic acid)- soybean (229), peanut (251), rapeseed (259), and palm kernel (277);

Stearoyl - soybean (229), peanut (251), rapeseed (259), and palm kernel (277); Arachidoyl (from Arachic acid) - soybean (229), peanut (251), and rapeseed (259); Behenoyl – peanut (251); and

Myristoyl - soybean (229), and palm kernel (277).

For margaroyl, a dictionary definition of the term is enclosed from "Webster's Third International Dictionary" (Unabridged) G.C. Merriam & Co. , p. 1381,(1961) (Reference 2) – where it is noted that margaric acid is a mixture of stearic acid and palmitic acid. The vegetable sources for stearic acid and palmitic acid have already been given above.

All of the disclosed and claimed fatty acids or acyl groups appear to have vegetable sources. In view of this additional information, available in the open literature at the time of filing the application, it is respectfully submitted that the above objection is traversed and should be withdrawn.

- 4. (Referring now to Items 2 and 3 of the official action). Claims 6-17 and 19-22 stand rejected under 35 USC 112, first paragraph as failing to comply with the enablement requirement.
- 4A. One part of the rejection is based on the following: "Applicant cannot claim non-epoxidized esters in the dependent claims when the independent claim restricts the invention to epoxidized esters. Applicant respectfully traverses this part of the rejection.

Independent claim 1 is at issue here since claims 6-14 ultimately depend on Claim 1. Claim 1 has been amended at line 6, by the addition of the adjective "unsaturated" after "wherein said" to provide greater clarity. Antecedent is in the same line. Claim 1 at lines 5 and 6 requires that at least 80% of the fatty acids in the oil be "unsaturated". This means the remainder are saturated so that it is not possible to form epoxidized derivatives from the remainder. Thus claim 1 allows

both saturated and unsaturated fatty acids that are consequently epoxidized and nonepoxidized. Applicant respectfully further refers the Examiner's attention to lines 7 and 8. Claim 1 only requires that the "esterified unsaturated fatty acids" be "substantially fully epoxidized". Therefore "nonepoxidized fatty acids" such as those that are based on saturated fatty acids as in the dependent claims appear to fulfill the requirements of claim 1 and the dependent claims 6-14 appear to be proper.

Claims 6-14 depend on claim 1, it is submitted that the above discussion traverses the rejection for these claims.

Claims 15-17 have been cancelled.

With respect to claim 19, the claim requires only that at least one of the selected R's be epoxidized to fulfill the definitional requirements in the preamble. For the same reason dependent claim 20 appears proper.

With respect to claim 21, the claim requires only that at least one of the R's be epoxidized to fulfill the definitional requirements in the preamble. For the same reason dependent claim 22 appears proper.

Applicant having fully traversed the grounds for rejection, respectfully requests withdrawal of this part of the rejection.

## 4B. Another part of the rejection is based on: "Disoyate and tetrasoyate esters cannot contain non-soy acyl groups.

It is respectfully submitted that all of the acyl groups are of soy origin. It has already been shown above in Section 3 of these REMARKS that linoleoyl, oleoyl, linolenoyl, palmitoleoyl, palmitoyl, stearoyl, arachidoyl, myristoyl, and margaroyl acyl groups are all available from soybean sources. The acyl group behenoyl is likewise available from soybean sources. Referring now to the Codex Alimentarius Commission, Twenty-fourth Session, Geneva, Switzerland, 2-7 July, 2001 (Reference 3), Table 1 thereof on page 28 shows that behenic acid (C22:0) is present in the soybean oil samples tested from not detectable to up to about 0.7%. It is noted that behenic acid is designated as (C22:0, i.e. 22 carbons in length and having no double bonds) in Reference 1, page 64. In a publication by Nexsoy, the behenic acid content of soybean oil is given at 0.37% (Spectrum Foods, Inc., P.O.

Box 30, 801 Yale Ave., Unit 5B, Swarthmore, PA 19081) (Reference 4).

In like way the acyl groups in currently amended Claim 9 for the "mixture of epoxidized methyl soyates" are all obtainable from soy sources. This applies to all soybean oil derivatives herein.

Applicant, having fully traversed the grounds for rejection, respectfully requests withdrawal of this part of the rejection.

# 4C. Another part of the rejection is based on "A mixture cannot contain only one ingredient (claim 9)".

Applicant has amended claim 9 so that "soyate" is now in the plural to read "soyates". Antecedent is found within the claim. As the examiner has noted a mixture requires more than one ingredient. Therefore there must be more than one soyate present or there can be no mixture. Accordingly the claim is amended to include a plurality of soyates, and the rejection is respectfully traversed.

# 4D. Another part of the rejection is based on: "Furthermore the epoxidized and non-epoxidized ingredients, which could be "R"-s, if all valences had not been already occupied by soy, are not of vegetable origin.

The issue of non-vegetable ingredients has already been addressed earlier in Section 3 of the present REMARKS and appears to answer the rejection noted here.

Applicant, having fully traversed this ground for rejection, respectfully requests withdrawal of this part of the rejection.

# 4E. Another part of the rejection is based on: 'Claim 1 excludes non-epoxidized and/or not vegetable derived fatty acid products.

The issue of Claim 1 excluding non-epoxidized fatty acids has already been discussed in Section 4A of the present REMARKS. Therefore, <u>non-epoxidized</u> fatty acids that are saturated are not excluded.

With regard to the not vegetable fatty acid products it was shown in an earlier Section 3 of the present REMARKS that all the fatty acids and fatty acid products were of vegetable origin.

Applicant having fully traversed the grounds for rejection, respectfully requests withdrawal of this part of the rejection.

5. (Referring now to Items 4, 5 and 6 of the Official Action) Claims 1, 4-6, and 8-12 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Examiner has noted that in Claim 1, the phrase "a fatty acids" is grammatically incorrect. Applicant has deleted the "a" before "fatty acids".

The Examiner has noted that in Claim 4, penultimate line, the phrase "and mixtures of derivatives thereof" is indefinite. Applicant has deleted this phrase.

The Examiner has noted that in claims 5, 6, and 9, the phrase "said plasticizer composition" has no antecedent basis in claim 1. "Said plasticizer" is enough. Applicant has amended the claims to refer to "said plasticizer" only.

The Examiner has noted that in Claims 8, and 10-12 that the "said composition" should be replaced by "said plasticizer". Applicant has amended these claims accordingly.

Applicant thanks the examiner for the above helpful remarks and comments. Applicant having fully traversed the grounds for rejection, respectfully request withdrawal of this part of the rejection.

Applicant has found that claims 6 through 10, 12, 19, and 21 have a comma missing after "palmitoleoyl" in the Markush list. The comma has been added.

#### 6. (Referring now to Items 7, 8, and 9 of the Official Action)

Applicant has cancelled independent claims 15-17.

#### 7. New Claims

Applicant submits new claims 31 to 33.

Claim 31 uses the text of cancelled claim 15 as antecedent and is rewritten to depend on claim 1. Claim 31 now clearly provides that the plasticizer be a mixture. Antecedent for mixtures is found in the specification at page 7, line 24 to page 7, line 5. It is respectfully submitted that Claim 31 is patentable over the art as it further limits the plasticizer of claim 1 to a mixture of epoxidized pentaerythritol tetrasoyates.

Claim 32 uses the text of cancelled claim 16 as antecedent and is rewritten to depend on claim 1. Claim 32 now clearly provides that the plasticizer be a mixture. Antecedent for mixtures is found in the specification at page 7, line 24 to page 7, line 5. It is respectfully submitted that Claim 32 is patentable over the art as it further limits the plasticizer of claim 1 to a mixture of epoxidized propylene glycol disoyates.

Claim 33 uses the text of cancelled claim 17 as antecedent and is rewritten to depend on claim 1. Claim 33 now clearly provides that the plasticizer be a mixture. Antecedent for mixtures is found in the specification at page 7, line 24 to page 7, line 5. It is respectfully submitted that Claim 33 is patentable over the art as it further limits the plasticizer of claim 1 to a mixture of epoxidized ethylene disoyates.

All of the new claims appear to fall within the subject matter included in the examination up to now.

It is believed that the above amendments address the examiner's concerns regarding the claims. Accordingly it is respectfully submitted that the rejections have been traversed and that the remaining claims appear allowable.

8. Applicant hereby requests and petitions for a three month extension of time. The fee is enclosed herewith.

In light of the amendments and remarks herein, it is respectfully submitted that the present application appears to be fully in condition for allowance; therefore, allowance of the application is earnestly solicited. Applicant's undersigned attorney has made a good faith effort to meet the concerns expressed by the Examiner in the Official Action. If the Examiner still has some issues with the application, and has any suggestions as to how to address them, the Examiner is invited to call the Applicant's undersigned attorney at the phone number given below, so that those issues can be worked out.

Respectfully submitted,

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April 9, 2004

### Fats and Oils Handbook

Michael Bockisch Hamburg, Germany



Champaign, Illinois

This book is dedicated to my wife Gudrun to whom, in the course of doing this translation, revision, and update, I had to break my promise never to write a book again, and also to my son Benjamin and my daughter Valerie.

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#### **Preface**

Oils and fat they contain ply essential and varied v vor, making

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**TABLE 2.6** Occurrence of Minor Fatty Acids in Different Oils (%)

In marin	e oil: he	erring oila									
C <sub>16:me-7</sub>	0.3	C <sub>16:2ω6</sub>	0.4	$C_{16:2\omega4}$	0.6	$C_{16:3\omega4}$	0.4	$C1_{6:4\omega1}$	0.6	$C_{18:1\omega 5}$	0.4
$C_{18:2\omega 4}$	0.1	$C_{18:3\omega6}$	0.3	$C_{18:3\omega3}$	0.9	$C_{20:0}$	0.1	$C_{20:1\omega 9}$	0.3	$C_{20:2}$	0.2
$C_{20:4\omega6}$	0.4	$C_{20:4\omega 3}$	0.4	$C_{22:2\omega6}$	0.2	$C_{22:5\omega 3}$	0.4	C <sub>24:1</sub>	0.4	Phytanic	0.2
In vegeta	ble oil:	rapeseed (	oil <sup>b</sup>								
$C_{14:1\omega 9}$	tr	$C_{14:1\omega7}$	0.007	$C_{14:1\omega 5}$	0.004	$C_{14:2\omega6}$	0.02	$C_{14:3\omega3}$	tr	C <sub>15:0</sub>	0.02
C15:1 <sub>ω</sub> 10	0.02	$C_{15:1\omega10}$	0.01	$C_{15:1\omega8}$	tr	$C_{16:1\omega7}$	0.29	$C_{16:2\omega6}$	0.07	$C_{16:3\omega3}$	0.13
C17:0	0.05	C <sub>17:1ω8</sub>	0.06	$C_{19:0}$	0.02	$C_{19:1\omega10}$	0.02	$C_{20:2\omega6}$		$C_{20:3\omega6}$	0.20
In anima	l fat: lar	$d^b$									
$C_{13:0}$	0.08	$C_{15:0}$	0.02	C <sub>17:0</sub>	0.29	$C_{19:0}$	0.03	C <sub>21:0</sub> .	0.004	$C_{23:0}$	0.02
C <sub>23:0br1</sub>	0.008	C <sub>24:0br1</sub>		C <sub>25:0br1</sub>	0.02	$C_{26:0br1}$		C <sub>12:1</sub>	0.02	C <sub>14:1</sub>	0.03
C15:1	0.01	C <sub>17:1</sub>	0.22	C <sub>19:1</sub>	0.06	$C_{21:1}$	0.004		0.02	$C_{22:5}$	0.02
C <sub>20:0br4</sub>	0.02	C <sub>22:0br4</sub>	0.02	C <sub>24:0br4</sub>	0.03	C <sub>26:0br4</sub>	0.03	C <sub>28:0br3</sub>	0.09	C <sub>28:0br4</sub>	0.20

<sup>&</sup>lt;sup>a</sup>Source: Sigurgísladóttir and Pálmadóttir (1993).

**TABLE 2.7** Occurrence of Fatty Acids<sup>a</sup>

	urated fatty acids 1 <sub>2n</sub> O <sub>2</sub>	Occurrence in common oils and fats
n n	Trivial name	Sources with remarkable proportion (% of total fatty acids)
4	Butyric	milk fat (3-5)
6	Caproic	milk fat (2–3), coconut oil (≤1)
8	Caprylic	milk fat ( $\leq$ 2), babassu oil (3–5), coconut oil (4–6), palm kernel oil ( $\leq$ 3), cuphea painteri (65–75), hookeriana ( $\sim$ 65)
10	Capric	milk fat (3-4), babassu oil (4-7), coconut oil (6-9), cuphea species (88-92
12	Lauric	coconut oil, palm kernel oil (45–50), Litsea sebifera (~95),
		Cinnamonium inners (~95), cuphea tolucana (~65)
14	Myristic	coconut, palm kernel, babassu oil (15–17), herring oil (4–8), nutmeg oil (≤77) Gymnacranthera contracta (~85), Scyphocephalum ochocoa (~80), cuphea palustris (~65)
16	Palmitic	coconut oil, palm kernel oil, babassu oil, sesame oil (7–10), cottonseed oil (17–25), milk fat (33–38), lard (20–30), tallow (25–40), herring oil (7–13) menhaden oil (15–30) <i>Myrica carolinensis</i> (~80), <i>Ochna sqarrosa</i> (~75), <i>Rhus succedanea</i> (~70)
18	Stearic	lard (16–24), tallow (15–30) Canarium schweinfurthii (85), Garcinia species (60–65)
20	Arachic	peanut oil (5-7), milk fat (2-4) nephelium species (>30)
22	Behenic	peanut oil (5–7), mustard seed oil (≤1,5) <i>lophira</i> species (20–35), <i>Psochocarpus tetragonolobus</i> (~20)
24	Lignoceric	peanut oil (≤3), mustard seed oil (≤1), adenanthera pav. (~30), eleagnus angustifolia (~20), tamarindus indica (~20)
26	Cerotic	pentachletra macrophyllia (~5), rumex pseudonatronatus (~3), vermonia anthelmica (~3)

Continued

TABLE 2 (Continu Monouns  $C_n H_{2n} O_2 \\$ n 12 14 16 18 18 18 18 20 20 22 **Polyuns**  $C_nH_{2n}C$ 18 18 18 20 20 22 22 1: Specia

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T R 18 24 N 24 . N 24 C 2 24 <sup>a</sup>For th Hilditc

bSource: Sebedio (1979).

cSource: Iverson et al. (1965).

TABLE 2.7 (Continued)

0.4 0.2 ic 0.2

> 0.02 0.13 0.20

0.02 0.03 0.02 0.20

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88-92)

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*`ontinued'* 

	ounsaturated fati <sub>2n</sub> O <sub>2</sub> Trivial name	ty acids Occurrence in common oils and fats Sources with remarkable proportion (% of total fatty acids)
12 14	Lauroleic Myristoleic	sperm whale oil (4), thohaku nut oil milk fat, tissue fat, liver oil (≤1), whale oil (2,5), sperm whale oil (14) pygnantus kombo (20–23)
16	Palmitoleic	milk fat, tissue fat (≤5), fish oil (≤20), whale oil (≤15), sperm whate oil (≤27) kermadecia sinuata (~70), doxantha unguis (~65), plumeria alba
18	Oleic	(55–60) rapeseed oil (LEAR 55–65), peanut oil (45–65), sesame oil (35–50), corn oil (40–50), olive oil (55–85), goose fat (50–65) amaranthus trivolor (~90), garcinia multiflora (~88), corylus avellana (~85)
18	Elaidic	hady for of ruminants
18	Petroselinic	Apium leptophyllum (~85), Deverra aphylla (~85), Umbelliferae (18–70)
18	Vaccenic	butter fat (<2.5), beef tallow
20	Gadoleic	sperm whale oil (≤19)
20	Eicosenoic	jojoba oil (≤30), mustard seed oil (≤13), cod-liver oil (≤14) Limanthes species (60–75)
22	Erucic	rapeseed oil (HEAR 40–65), mustard seed oil (≤50) Crambe abbessynicum (~60), hispanica (~55)

Polyuncaturated fatty	3CIGC

unsaturated fatty acids	-ile and fats
zn 🕶 z	Occurrence in common oils and fats  Sources with remarkable proportion (% of total fatty acids)
x Trivial name	Sources with remarkable proportion (70 of total vary
	safflower oil (≤80), sunflower oil (≤75), poppy seed oil (≤65) Myrianthus species (88~94), betula platyphylla (~88)
	herring oil (≤20), menhaden oil (≤30), linseed oil (£47)  Acacia lenticularis (~80), Euphorbia species (75–78); (-linolenic: barley
( Flagostopric	1–2) Aleuritis species (65–85), Parinarium excelsum (~60)
	cod-liver oil (≤25), herring oil (≤30), menhaden oil (≤29)
	Cab alle fich liver oil
	cod-liver oil (œ10), herring oil (≤23), menhaden oil (≤12), sardine oil
10 Clupadonic	(≤14)
12 Cervonic	fish oils
cial fatty acids	Occurrence in common oils and fats
Trivial name	Sources with remarkable proportion (% of total fatty acids)
Ricinolic	castor oil (≤95)
Nisinic	tunny oil (> 40)
Nervonic	brain cerebrosides (70), cardamine graeca (> 50), tropaeolum spp. (> 40)
Cerebronic	brain cerebrosides (15)
2-Hydroxynervonic	brain cerebrosides (12)
	x Trivial name  4 Linoleic  6 Linolenic  6 Elaeostearic 8 Arachidonic 10 Timnodonic 10 Clupadonic  12 Cervonic  cial fatty acids Trivial name  Ricinolic Nisinic Nervonic Cerebronic

<sup>&</sup>lt;sup>a</sup>For the fatty acid composition of thousands of fats and oils of animal and vegetable origin, see among others Hilditch and Williams (1964) and Ucciani (1995).

**TABLE 4.30** Fact File of Soybean Oil (Bean Oil)

German: Sojaöl	*	Fren	ch: huile de	soya	Spanish:	aceite de s	oja
Relative density		(at 20	0°C; ref. wat	er 20°C)	0.9	10-0.925	
Refractive index		(n <sub>D</sub> <sup>40</sup>	P)		1.4	66–1.470	
Saponification val	ue		KOH/g oil)		1	89–195	
Iodine value		(Wijs	method)		1	120–143	
Unsaponifiable m	atter	(g/kg	oil)			<15	
Melting point:	–9 to –11	°C		Solidification	point	–8 t	o –18℃
Solids content at	(°C/°F)	0/32	5/41	· 10/0	20/68	30/86	35/95
	(%)	0.5	0	0	0 .	. 0	0
World market price	ce			(U.S. \$/MT)	min	Ø	max
		•		1962–1995	157	440	1044
Price index (1995	average co	ompared to	average)	1962–1969	157	223	303
10 years ago		103%		1970–1979	220	487	303
20 years ago		104%		1980–1989	279	493	1044
30 years ago	2	262%		1990–1995	398	508	670

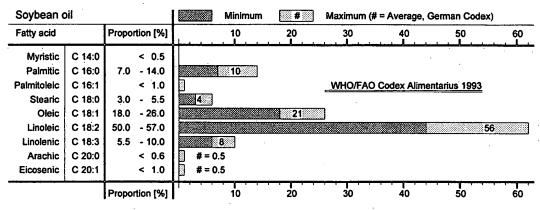


Fig. 4.49. Fact file of soybean oil (fatty acid composition).

#### 4.3.2 Cottonseed Oil

4.3.2.1 Botany and History of Cotton. Cotton (Gossypium) is cultivated mainly for its fiber. The ratio of fibers to seed is ~1:2. The seed itself contains ~20–25% fat. From tools and fabrics found in excavations, it can be concluded that cotton has been cultivated for 4500–5000 years. Up to 600 B.C., India maintained a monopoly on cotton (called woven wind). In the period 600–500 B.C., cotton came to Egypt; later, in 333 B.C., it was imported to Europe by the Greek emperor, Alexander the Great. The oil content of the seeds is mentioned for the first time by the Greeks, Herodot and Theophrast. In the Middle Ages, the seed was rediscovered by Marco Polo (1271) who reported on it. Only in the 19th century did it become an item traded worldwide because only then did mechanical delintering, spinning and weaving equipment

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3°C, ca. 30min

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Expeller cake

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Soya hulls

**TABLE 4.41**Fact File of Peanut Oil

German: Erdnußö	l	Frenc	ch: huile d'a	rachide	Spanish: a	ceite de cac	ahuete
Relative density		(at 20	O°C; ref. wat	er 20°C)	0.9	14–0.917	
Refractive index		(n <sub>D</sub> <sup>40</sup>	) )		1.4	60–1.465	
Saponification val	ue		KOH/g oil)		1	87–196	
lodine value			method)			80–106	
Unsaponifiable m	atter	(g/kg	oil)			<10	
Cloud point:	–2°C			Solidification	point	-2 to +3	℃
Solids content at	(°C/°F)	0/32	5/41	10/50	20/68	30/86	35/95
	(%)	<6	<5	<4	<2	0	.0
World market price	ce	<u> </u>		(U.S. \$/MT)	min	Ø	max
				1967–1994	236	686	1213
Price index (1995	average co	ompared to	average)	1967–1970	236	287	359
10 years ago		111%	J	1970–1979	329	707	1213
20 years ago		126%		1980-1989	446	754	1179
25 years ago		273%		1990–1995	543	987	1060

Peanut oil					Minimum	0	Maximum (	# = Average, (	German Code:	K)	
Fatty acid		Propo	rtion [%]	1	10	20	30	40	50	60	70
Patmitic	C 16:0	6.0	- 16.0		10	]					
Palmitoleic	C 16:1	l	< 1.0				7	NHO/FAO Co	dex Alimentar	ius 1993	
Stearic	C 18:0	1.3	- 6.5	3.5							
Oleic	C 18:1	35.0	- 72.0							59	******
Linoleic	C 18:2	13.0	- 45.0			20			]		
Linolenic	C 18:3		< 0.3								
Arachic	C 20:0	1.0	- 3.0	#	= 1.5						
Eicosenoic	C 20:1	0.5	- 2.1	<b>*</b>	1.5						
Behenic	C 22:0	1.0	- 5.0	2.5							
Erucic	C 22:1	0.5	- 3.0	2.0							
Lignoceric	C 24:0	0.5	- 3.0	2.0							
		Propo	rtion [%]	1	10	20	30	40	50	60	70

Fig. 4.73. Fact file of peanut oil (fatty acid composition).

#### 4.3.5 Rapeseed

4.3.5.1 Botany and History of Rape. Rape (Brassica napus, Brassica campestris) is today cultivated mainly in Canada, Europe, India and China. It is much more durable than the other oilseeds, because it is able to withstand spring frost. It is therefore suitable for farming in the moderate climates of the north (or the far south).

Its origin is still not clear, but it appears to lie in Eurasia where it is already mentioned around 2000 B.C.; there is also a citation in Indian Sanskrit. In middle Europe, it is first mentioned in Holland in 1360 as "raepssaet."

Genotypes farmed today reach a height between 80 and 150 cm. Rape ripens 30-40 d after pollination. The pods have a length between 5 and 10 cm and are filled

s to 60%)

moisture <6%

rial for chipboards
 rial for construction materials

d moisture <5%



oxin is very difficult uld be limited to speuts.

acid composition, the Fig. 4.73 and 4.74).

be dried; othonly 20°C. If riods and for take the seeds ton of broken Yields are as will yield up

composition, 83 and 4.84).



**TABLE 4.45**Fact File of Rapeseed Oil (LEAR)

German: Rapsöl		Frenc	ch: huile de	colza	Spanish:	aceite de co	olza
Relative density		(at 20	0°C; ref. wa	iter 20°C)	0.9	14-0.920	
Refractive index		(n <sub>D</sub> <sup>40</sup>	9)		1.4	65-1.467	
Saponification val	ue	(mg l	KOH/g oil)		1	82-193	
lodine value		(Wijs	method)		1	10–126	
Unsaponifiable m	atter	(g/kg	oil)			<20	
Crismer value						67–70	
Brassica sterol		(% o	f total stero	ls)		>5	
Cloud point:	-10 to -1	2℃		Solidification	point	<<0°C	
Solids content at	(°C/°F)	0/32	5/41	10/50	20/68	30/86	35/95
	(%)	<1	0	0	0	0	0 .
World market price	ce			(U.S. \$/MT)	min	Ø	max
				1970–1995	208	480	968
Price index (1995	average co	mpared to	average)	1967–1970	236	287	359
10 years ago		18%		1970–1979	208	499	968
20 years ago		116%		1980–1989	199	464	863
25 years ago	2	213%		1990–1995	385	498	731

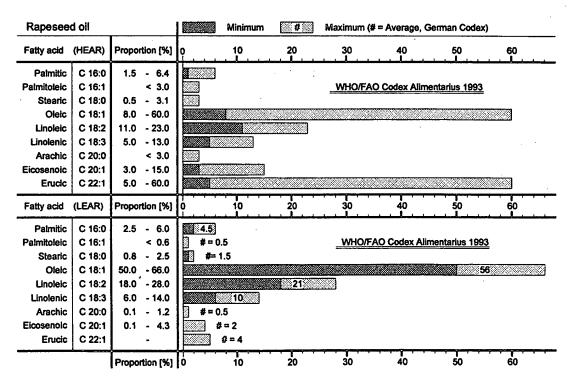


Fig. 4.83. Fact file of rapeseed oil (fatty acid composition).

**TABLE 4.53**Fact File of Palm Kernel Oil

German: Palmker	nfett	Frenc	ch: huile de	palmiste	Spanish: a	ceite de palr	miste
Relative density		(at 4	℃; ref. wat	er 20°C)	0.8	99–0.914	
Refractive index		(n <sub>D</sub> <sup>40</sup>	P)		1.4	48–1.452	
Saponification val	ue	(mg	KOH/g oil)		2	30–254	
lodine value		(Wijs	method)			14-20	
Reichert value						4–7	
Polenske value						8–12	
Unsaponifiable m	atter	(g/kg	oil)			<10	
Melting point:	25–30℃			Solidification	point	20–24℃	
Solids content at	(°C/°F)	10/50	15/59	20/68	25/77	30/86	35/95
	(%)	70	59	39	17	0.5	0
World market prid	ce			(U.S. \$/MT)	min	Ø	max
Price index (1990	average co	mpared to	average)	1972–1995	216	589	1322
10 years ago	g	7%		1972–1979	218	607	1322
15 years ago	1	03%		1980–1989	216	575	1232

Palm kerr	nel oil				Minimum	#	Maximum (#	= Average, Ge	erman Codex)
Fatty acid		Propos	rtion [%]	0	10	20	30	40	50
Caproic	C 6:0		< 0.8	0.5					
Caprylic	C 8:0	2.4	- 6.2	4		WHO/	FAO Codex Alir	mentarius 199	3
Capric	C 10:0	2.6	- 5.0	4					<del>.</del> .
Lauric	C 12:0	41.0	- 55.0						47
Myristic	C 14:0	15.0	- 18.0			16		,	
Palmitic	C 16:0	6.5	- 10.0		9				
Stearic	C 18:0	1.3	- 3.0	#	= 2.5				
Oleic	C 18:1	12.0	- 19.0		15	5			
Linoleic	C 18:2	1.0	- 3.5	#	= 2.5				,
	<del>'</del>	Propo	rtion [%]	Ö	10	20	30	40	50

Fig. 4.105. Fact file of palm kernel oil (fatty acid composition).

decreased. Today, in some parts of Europe, there is a revival triggered by the Green movement and promoted by new varieties.

Linseed requires mean temperatures of 18–21°C. In warmer regions such as India, it is a winter crop because too high temperatures lead to plant diseases that do not occur at lower temperatures.

After fading of the white to blue-violet flowers, a 6- to 8-mm capsule develops that holds the shiny deep brown seeds in two chambers of two seeds each (Fig. 4.106; for seed composition, see Fig. 4.107). The seeds have a long, oval shape and are ~4 mm in length. Depending on whether the plant is cultivated for the flax



I composiig. 4.105).

eight and is 3 2000 B.C. round 3500 y and from y imported ix quickly

W3903

# Webster's Third New International Dictionary

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1961

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SPRINGFIELD, MASSACHUSETTS, U.S.A.

marching unit esp. a mintal, (2): direction of movement troops into their country) (2): direction of movement troops into their country) (2): a course (did not like the current ~ of public opinion) 0: a course (did not like the current ~ of public opinion) 0: a course (did not like the current ~ of public opinion) 2: an instruction of the country of ımple ining ssing ining olvent es or *sarcan* led as k + E Jospel bal of fr. ML erh. fr. TALE
march-er \'march=(r), 'mach-\ n -s [ME marchier, marchere,
fr. marche border region + -er, -ier, -ere, -iere -er] 1: one
fthat inhabits a border region 2: a lord enjoying royal liberties and having jurisdiction over territory in the English
marches - called also lord marcher
marches pl of MARCH, pres 3d sing of
marches a mar'kāzə\ n, pl marche-sa \-(.)zā\ [It, fem. of
marchese]: an Italian woman holding the rank of a marchese
: MARCHIONESS Mar-a: any ed iron of iron ites and by its gravity piece of g orna-piece of \*\*MARCHIONESS
mar.che.se \-(,)z\(\overline{a}\) n, pl marche.si \-(,)z\(\overline{c}\) [It, fr. ML
mar.che.sis, fr. marca border region, of Gmc origin; akin to
OHG marha boundary — more at MARKI! an Italian nobleman next in rank above a count : MARQUIS
mar.chesh.van \mar'keshvon \n -s usu cap [Heb marheshwan]

\*\*HEGUNAN\*\* uperl. of lirection man next in rank above a count: MARQUIS

mar-chesh-van \mar'keshvən \ n - s usu cap [Heb marheshwān]

: HESHVAN

mar-chet \'marchət\ or mar-che-ta \mar'kād-ə\ also mormar-chet \'marchət\ n - s [ME merchet, fr. AF, fr. L mercatus
chet \'marchət\ n - s [ME merchet, fr. AF, fr. L mercatus
chet \'marchət\ n - s [ME merchet, fr. AF, fr. L mercatus
chet \'marchiət\ n - s [ME merchet, fr. AF, fr. L mercatus
chet \'marchiper nor at MARKET]: a fee paid to a British
trade, market place — more at MARCHET! a fee paid to a British
trade, market place — more at MARCHET!
also to a good to a british
trade, market place — more at MARCHET!
also to a British
trade, market place — more at MARCHET!
also marching the droit du seigneur
march fly n, usu cap M 1: a fly of the family Bibionidae that
usu. appears in early spring 2 Austral: HORSEFLY
marching fire n: ASSAULT FIRE
marching fire n: ASSAULT FIRE
marching orders n p! 1: orders to set out on a march:
from the pivot when executing a change of direction
marching orders n p! 1: orders to set out on a march:
to proceed (the division got its marching orders one day before
to proceed (the division got its marching orders one day before
to proceed (the division got its marching orders)
poor work and soon got his marching orders)

sold the wife of a marquess
1: the wife of a marquess
2: a woman who holds in her own right the rank of marquess
march king of arms of the late medieval period who had
English king of arms of the late medieval period who had
English king of arms of the late medieval period who had
in the west of England and in Wales and Cornwall
in the wife of a marching orders.

\*\*Marchem\*\* Marchem\*\* Marchem part. of th strong s [after wave or a heated marcels tarseilles] oneycomb reads marcels after such ither; akin Ir mraich, ay - more ing off <~ t parts LAND

march-man \'=man\ n, pl marchmen [ME marcheman, fr.
march-order region + man — more at MARCH]: MARCHER I
march-order \'=,z=\ v!: to ready (arms or other military
equipment) for marching (march-ordered the artillery)
equipment) for marching (march-ordered the artillery)
equipment) for marching (march-ordered the artillery)
at MARZIPAN]: MARZIPAN
march-past \'=,z\ n, pl march-past of his years — New
SION (reviews with relish the march-past of his years — New
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sion (reviews with relish the march-past of his years — New
sion (reviews with relish the march-past of his years — New
sion (reviews with America + viaceae) of e vegetative leaves and fr. Marc en epiphytic Parietales) into a hood rc.gra.vi.a-OF march, Mart-, Mars, nonth of the cionites
mar-cion-ite \-,nīt\ also mar-cion-ist\-,nèst\ n -s usu cap
[LL marcionita, marcionista, fr. Marcion + L -ita -ite or L
-ista -ist]: a member of an anti-Judaic Gnostic sect that flourished from the 2d century to about the 7th century A.D.
mar-co-man-ni \,märkə\ma,nī\ n pl, usu cap [L Marcomani,
Marcomanni]: an ancient Germanic people related to the
Suevians
mar-co-ni \märkonē mak-\ adi usi cas [Guella] rigin; akin to

1) : a border

y b: TERRI
fficial's juris-Suevians

Imar.co.ni \mar'konē, ma'k-\ adj, usu cap [Guglielmo Marconi †1937 Ital. electrical engineer and inventor]: of or relating to the system of wireless telegraphy invented by Marconi (a Marconi erial)

Marconi \marconied; marconied; marconiing; marconies: to send (a message) by radiogram conies: to send (a message) by radiogram

Imarconi \marconied; system of struts and stays formerly charactof the complex system of struts and stays formerly charactoristic of the Bermuda rig to the poles and stays used in wireless telegraphy]: of, relating to, or marked by a Bermuda rig (a Marconi mainsail)

mar.co.ni.gram \marconi gram \n [\marconi + -gram]: RADIOGRAM mar.co.ni.graph \marconi graf, -raf\ n [\marconi + -graph]: ap-F marchir, fr. r marchir, it.
cation: have
ly parallel or
north and the
ranges that
'e Series: Vt.
1 or 'hach vb trample under prob. of Gmc the boundaries more at a regular meas-rhythmic stride

ng

IT-

3 OF

dis-

of -

ing (enviously up the street)

Croatian mora, and prob. to Gk marainein to waste away — more at SMART] obs: an evil preternatural being conceived of more at SMART] obs: an evil preternatural being conceived of as causing nightmare

2mare \'ma(a)|ar, 'me|, |a\ n -s [ME mare, mere, fr. OE mere; akin to OHG merha mare, ON merr mare, OE mearh horse, OHG marah, ON marr, W march] 1: a female horse or other equine animal esp. when fully mature or of breeding age

— compare FILLY 2 chiefly Scot: 'TRESTLE 1a

3ma.re \'ma(a)re, 'ma(a), 'ma(b)ra\ n, pl ma.ria \|rea\|rea\|
[NL, fr. L, sea — more at MARINE]: one of several dark areas of considerable extent on the surface of either the moon or Mars of considerable extent on the surface of either the moon or Mars

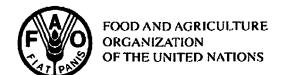
ma\*re\*ca \ma\*rēka\ n, cap [NL, fr. Pg marreca wild duck]: a
genus comprising the widgeons
mare clau\*sum \-'klòsam, -'klau,sùm\ n [NL, closed sea]
: a sea or other navigable body of water that is under the
jurisdiction of one nation and that is closed to other nations
ma\*re\*han \'mära,hän\ n, pl marehan or marehans usu cap

1: a negroid people of Somaliland in the eastern part of
Africa 2: a member of the Marehan people
mare 11.be\*rum \-'libəram, -'libə;rum\ n [NL, free sea]

1: a sea or other navigable body of water that is open to all
nations 2: freedom of the seas
ma\*rem\*ma \ma\*remo n -s [It, fr. ML maritima places near
the sea, fr. L, neut. pl. of maritimus maritime — more at
MARITIME]: swampy coastland
mareng cell \'mä,ren-\ n, usu cap M [mareng fr. Glenn L.
Martin b1886 Am. airplane manufacturer + E engineering]:
a fuel container made of airplane cloth impregnated inside
and outside with a synthetic rubber that tends to seal up
punctures punctures
ma-ren-go \mo'ren(,)go\ adj, often cap [F, fr. Marengo,
village in northwest Italy; prob. fr. the serving of a chicken
marengo to Napoleon after his victory over the Austrians at
Marengo in 1800]: of, consisting of, or served with a sauce
made of mushrooms, tomatoes, olives, oil, and wine (sautéed chicken ~>
mare nos-trum \-'nästrəm, -'nä,strùm\ n [L, our sea; fr. the fact that the Roman Empire at its greatest extent included all lands bordering on the Mediterranean]: a sea or other navigable body of water that belongs to a single nation or that two or more nations share by mutual agreement
mareograph var of MARIGRAPH
mare's nest n, pl mare's nests or mares' nests 1: a hoax or fraud or some other nonexistent or illusory thing that seems at first to be very wonderful and full of promise but that ultimately brings ridicule on those deceived by it (creating a neat little mare's nest in English dramatic history —R.S.Loomis\ (spent his whole life looking for what was actually a mare's nest) (had made a mare's nest of the administration)
mare's tail n 1 pl mare's tails or mares' tails: a cirrus cloud that has a long slender flowing appearance 2 pl mare's tails a: a common aquatic plant (Hippuris vulgaris) with elongated shoots clothed with dense whorls of subulate leaves b: HORSETAIL 2 C: HORSEWED 1
marey's law mo'tāz-\ n, usu cap M [after Étienne Jules Marey †1904 Fr. physiologist]: a statement in physiology: heart rate is related inversely to arterial blood pressure marefire \markfi(a)r\ n [perh. fr. E dial. mar (alter. of E 1 mere) + E fire] dial Eng: phosphorescence occurring on the sea
marg abbr margin; marginal mare nos-trum \-'nästrəm, -'nästrûm\ n [L. our sea: fr. the marg abbr margin; marginal
marga \'marga \n - s \strain \text{Skt marga} \text{ parga path, fr. mrga deer, gazelle} \text{ 1 Hinduism : one of several ways of approaching salvation—compare BHAKTI-MARGA 2: EIGHTFOLD PATH
marga-rate \'marga-rate \'marga-rate \'marga-rate \n - s \strain \text{ISV margaric} \text{ (in margaric} \text{ acid} \to - ate] : a salt or ester of margaric acid
mar-ga-ret grunt \'marg(3)r\delta \n - n \strain \text{ margaret} \text{ by folk etymology (influence of the name Margaret) fr. margate! MARGATE a
margar-ic acid \mar'garik, ma|, \"garik, "ma|, \"rek-\n \n \margaric \text{ fr. margarlae, fr. margar-ic, \text{ mal, } \"earlae, \"margar-ic, \"mal, \"earlae, \"margar-ic, \"mal, \"earlae, \"margar-ic, \"margar-ic] 1: a crystalline synthetic fatty acid
CH3(CH2)\_15COOH intermediate between palmitic acid and stearic acid obtained from various natural fats, oils, and waxes and formerly mistaken for a single acid
mar-ga-rin \'margar\text{ margarine margarine } \"margar\text{ margarine } \"margar\text{ margarine } \"margar\text{ margarine acid; esp} : glycerol tri-margarate
mar-ga-rine also mar-ga-rin \"marj|(0)r\text{ n. margarine } \"margar\text{ margarine also mar-ga-rin \"marj|(0)r\text{ n. margarine } \"margar\text{ margarine acid; esp} : glycerol tri-margarate
mar-ga-rine also mar-ga-rin \"marj|(0)r\text{ n. margarine } \"margar\text{ margarine acid; esp} : glycerol tri-margarate
mar-ga-rine also mar-ga-rin \"marj|(0)r\text{ n. margarine } \"margar\text{ margarine acid; esp} : glycerol tri-margarate
mar-ga-rine also mar-ga-rin \"marj|(0)r\text{ n. margarine } \"margar\text{ margarine acid; esp} : glycerol tri-margarate
mar-ga-rine also mar-ga-rin \"marj|(0)r\text{ n. margarine } \"margar\text{ from a blend of refined oils esp. vegetable oils (as cottonseed oil, soybean oil) to which other ingredients (as salt, emulsifiers, vitamin A, vitamin D) are added and that is churned with ripened skim milk so as to have a consistency that permits ready mar.ga.ri.ta.coous \'margara',tashas\ adj [L margarita pearl + E -aceous]: having a satiny iridescence like that of pearl or mother-of-pearl : PEARLY mother-of-pearl: PEARLY
mar-ga-rite \'marga-rit\\ n -s [ME, fr. MF, fr. L margarita,
fr. Gk margarits, fr. margaron pearl (prob. fr. Skt mañjara
pearl, cluster of blossoms) + -itēs -ite] 1 archaic: PEARL
2 [G margarit, fr. Gk margaritēs pearl]: a mineral CaAl,Si<sub>2</sub>O<sub>10</sub>(OH)<sub>2</sub> consisting of a basic aluminum calcium
silicate related to mica but low in silica and yielding brittle
folia marked by a pearly luster 3 [F margarite, fr. Gk
margaritēs pearl]: a primary form of rock crystallization in
which globulites are arranged lineally like beads 4 [NL
Margarites]: a top shell of the genus Margarites
pearl]: a genus of minute top shells that are widely distributed
in cold northern seas and that are an important item of diet for
cod and other fishes cod and other fishes
mar-ga-ro-des \,märgə'rō,dēz\ n, cap [NL, fr. Gk margaron
pearl + NL -odes]: a genus of scales — see GROUND PEARL
mar-ga-ro-dite \'märgərō,dīt\ n -s [G margarodit, fr. MGk
margarōdēs like a pearl (fr. Gk margaron pearl + -ōdēs -ode)
+ G-it-ite]: a pearly common mica resembling talc
mar-gar-o-pus \märgarops\ n, cap [NL, fr. Gk margaros
pearl oyster (fr. margaron pearl) + NL -pus]: a genus of
ixodid ticks that in some classifications includes the cattle tick
mar-ga-ro-san-ite \,märgə'rōs'sn,it\ n -s [Gk margaron
pearl + sanis board + E-ite; fr. its pearly luster and lamellar
structure; prob. akin to Gk sathē penis, sainein to wag the
tail, OB thūma thumb — more at THUMB]: a mineral PbCa<sub>2</sub>(SiO<sub>2</sub>) consisting of a lead calcium silicate convering in color cod and other fishes

of someth adjoining the remai joining su (1): the l water (sto or surface boundary b: the pa felt only the stiles land of a hole 4 a necessary spare amo tingencies making fi choice in country —Walter for medita below wh no longer the  $\sim$  of (2): the tinued unwith regar on an inv an econor productio that exists and that i profit der or other b: the exc c(1): cas secure hir principal: the purch: terminated transactio (4): an which a po of differer was 54 to and consu 2margin \ comments material v 2 a: to pr page that lie extende (a bright deposit a secured by mar gin : maregine, m ten or pri b: having script) 2 parts of a margin (or the border (~ group: poration c by incomp new immig and near carpellary sciousness qualificati b (1): ha of goods barely cov ⟨~ produ limit or m price level the costs of 2marginal note writte of a page the edge of of a mollu marginal that is cau leaves marginal : LITHOCY: marginal c n: the cou marginal ( that devel marginal l mar•gi•na neut. pl. c trinsic ma essentials mar-gin-a that stress equilibrius mar-gin-a marginal mar gin a being ma marginal l tween wh mar gin a manner ( margin ( —H.G.We

# REFERENCE 3 codex alimentarius commission





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ALINORM 01/17

#### JOINT FAO/WHO FOOD STANDARDS PROGRAMME

#### **CODEX ALIMENTARIUS COMMISSION**

Twenty-fourth Session Geneva, Switzerland, 2-7 July 2001

#### REPORT OF THE SEVENTEENTH SESSION OF THE CODEX COMMITTEE ON FATS AND OILS

London, United Kingdom 19 – 23 February 2001

Note: This document incorporates Codex Circular Letter 2001/4-FO

Table 1: Fatty acid composition of vegetable oils as determined by gas liquid chromatography from authentic samples 1 (expressed as percentage of total fatty acids) (see Section 3.1 of the Standard) (continued)

							^		
Fatty acid	Fatty acid Palm stearin Rapeseed oil Rapeseed oil (low erucic a	Rapeseed oil	Rapeseed oil (low erucic acid)	Safflowerseed oil	Safflowerseed oil (high oleic acid)	Sesameseed oil	Soyabean oil	Sunflowerseed oil	Sunflowerseed oil (high oleic acid)
C18:1	15.5-36.0	8.0-60.0	51.0-70.0	8.4-21.3	70.0-83.7	35.9-42.3	17-30	14.0-39.4	75-90.7
C18:2	3.0-10.0	11.0-23.0	15.0-30.0	67.8-83.2	9.0-19.9	41.5-47.9	48.0 -59.0	48.3-74.0	2.1-17
C18:3	ND-0.5	5.0-13.0	5.0-14.0	ND-0.1	ND-1.2	0.3-0.4	4.5-11.0	ND-0.3	ND-0.3
C20:0	ND-1.0	ND-3.0	0.2-1.2	0.2-0.4	0.3-0.6	0.3-0.6	0.1-0.6	0.1-0.5	0.2-0.5
C20:1	ND-0.4	3.0-15.0	0.1-4.3	0.1-0.3	0.1-0.5	ND-0.3	ND-0.5	ND-0.3	0.1-0.5
C20:2	ND	ND-1.0	ND-0.1	ND	ND	ND	ND-0.1	QN	ND
C22:0	ND-0.2	ND-2.0	ND-0.6	ND-1.0	ND-0.4	ND-0.3	ND-0.7	0.3-1.5	0.5-1.6
C22:1	NΩ	> 2.0-60.0	ND-2.0	ND-1.8	ND-0.3	ND	ND-0.3	ND-0.3	ND-0.3
C22:2	ND	ND-2.0	ND-0.1	ND	ND	ND	QN	ND-0.3	ND
C24: 0	ND	ND-2.0	ND-0.3	ND-0.2	ND-0.3	ND-0.3	ND-0.5	ND-0.5	ND-0.5
C24:1	ND	ND-3.0	ND-0.4	ND-0.2	ND-0.3	ND	ND	ND	ND

ND - non detectable, defined as  $\leq 0.05\%$ 

<sup>1</sup> Data taken from species as listed in Section 2.







#### REFERENCE 4

spectrum foods,
inc.

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Corporate Office: P.O. Box 3483 2520 S. Grand Ave East Springfield, IL 62703 217.391.0091 ph 217.391.0096 fax

#### ORGANIC SOYBEAN OIL SPECIFICATION SHEET

DESCRIPTION: All Nexsoy Soybean Oils are naturally expelled soybean oils, which have been expelled without the use of solvents or other chemicals. The bulk organic soybeans are first cleaned of all foreign matter before they are mechanically extruded. The resulting meal is then mechanically expelled, after which the oil is sent to storage tanks. The soy oil is naturally cold-pressed, which provides the maximum amount of tocopherols.

PRODUCT: SHELF LIFE:		Crude, Naturally Expelled Organic Soybean Oil, Certified Kosher**  Minimum of three years at room temperature and dim light.					
*Appearance:		Brilliant Dark Golden	*Moisture & Volatiles %:		.03%		
*Free Fatty Acid, % max:		3%		*Total Tocopherols, ppm:		1516	
*Phosphorus, ppm:		200		*Color:	Yellow	40	
*Peroxide Value (meg/kg):		0.3		Red		3.5	
*lodine Value:		133	*Flash Point, Degrees F:		300 Degrees F		
		FATTY ACID	COMPOSIT	ION, %			
C16: 0 Palmitic	10.14%	C18: 2 Linoleic	51.47%		C22: 0 Behenic:	0.37%	
C17: 0 Margaric	0.11%	C18: 3 Linolenic	8.31%		C24: 0 Lognoceric:	0.12%	
C18: 0 Stearic	4.20%	C20: 0 Arachidic	0.35%		Other:	0.17%	
C18: 1 Oleic	24.31%	C20: 1 Gadoleic	0.19%				

<sup>\*</sup> Applications: Used by manufacturers for cooking oil, baked goods, among others. Not for frying.

<sup>\*\*</sup> Available as Non-GMO or Organically Certified Non-GMO

PRODUCT: SHELF LIFE:		Degummed, Naturally Expelled Organic Soybean Oil, Certified Kosher**  Minimum of three years at room temperature and dim light.					
*Appearance:		Brilliant Dark Golden		*Moisture & Volatiles %:	.03%		
*Free Fatty Acid, % max:		3% *Total Tocopherols.		*Total Tocopherols, ppm:	1447		
*Phosphorus, ppm:		25		*Color: Yellow	40		
*Peroxide Value (meg/kg):		0.3		Red	3.5		
*lodine Value:		133		*Flash Point, Degrees F:	560 Degrees F		
		FATTY ACID	COMPOSI	TION, %			
C16: 0 Palmitic	10.14%	C18: 2 Linoleic	51.47%	C22: 0 Behenic:	0.37%		
C17: 0 Margaric	0.11%	C18: 3 Linolenic	8.31%	C24: 0 Lognoceric:	0.12%		
C18: 0 Stearic	4.20%	C20: 0 Arachidic	0.35%	Other:	0.17%		
C18: 1 Oleic	24.31%	C20: 1 Gadoleic	0.19%				

<sup>\*</sup> Applications: Used by manufacturers for cooking oil, frying, baked goods, among others.

<sup>\*\*</sup> Available as Non-GMO or Organically Certified Non-GMO

PRODUCT: SHELF LIFE: TYPICAL ANALYSIS: *Appearance: *Free Fatty Acid, % max: *Phosphorus, ppm: *Peroxide Value (meq/kg): *lodine Value:		Refined, Bleached & Deodorized, Naturally Expelled Organic Soybean Oil, Certified Kosher*						
		Minimum of one year at room temperature and dim light.						
		Brilliant Light Golden 0.03% 3 0.70 132		oisture & Volatiles %: tal Tocopherols, ppm: lor: Yellow Red ash Point, Degrees F:	.06% 1250 5.80 0.60 570 Degrees F			
C16: 0 Palmitic C17: 0 Margaric C18: 0 Stearic C18: 1 Oleic	10.14% 0.11% 4.20% 23.10%	FATTY ACID C18: 2 Linoleic C18: 3 Linolenic C20: 0 Arachidic C20: 1 Gadoleic	COMPOSITION 53.10% 7.9% 0.20% 0.19%	, ,	0.37%			

<sup>\*</sup> Applications: Used by manufacturers for cooking oil, frying, baked goods, among others.

Nexsoy® Oils are produced by Thumb Oilseed Producers Cooperative in Ubly, MI and are marketed and sold exclusively by Spectrum Foods, Inc.

<sup>\*\*</sup> Available as Non-GMO or Organically Certified Non-GMO